Chemical Analysis Report

WQAP-2016-09-21-02

Florida Department of Environmental Protection
Central Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

Event Description: **Reference Lake -**
Request ID: **RQ-2016-09-19-21**
Customer: **WQAP**
Project ID: **LAKESREF**

Send Reports to:
FL Dept. of Environmental Protection
2199 South Rock Road
Fort pierce, FL 34945
Attn: Matthew Sewell

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Certified by: Thekkekalathil Chandrasekhar, Chemist Administrator Date Certified: 19-OCT-2016 16:28

Case Narrative

Unless otherwise noted, all samples included in this report were received in accordance with protocols referenced in Chapter 62-160, Florida Administrative Code (F.A.C.). Results published in this report pertain only to the samples as submitted to, and received by the laboratory. All times in this report are adjusted to the applicable Eastern Time Zone (EST or EDT).

Results for the following analytical groups are included in this report: Metals and Nutrients.

Scientific notation may be used in reporting very large or small values. Values reported using scientific notation will take the form of the following example: 1.3E+03, which is equivalent to 1.3×10^3 or 1300.

Unless otherwise noted, analytical values for soil and sediment samples are reported on a dry weight basis, and analytical values for waste and tissue samples are reported on a wet weight basis.

Results for TNI accredited tests met requirements established by The NELAC Institute. A double asterisk (**) is used to indicate an analyte/matrix/method for which the laboratory is not TNI accredited or where accreditation for that field of testing is not applicable.

Any significant anomalies or deviations from established protocols are documented in Non-Conformance Reports, which, where appropriate, are included within this analytical report. Additional comments related to specific analytical tests may be included as remarks following the analytical results for each sample. Such comments and remarks are for informational purposes only and are not intended to convey judgement about the usability of the reported data.

A quality control report on the performance of the test method for the submitted samples is included. Uncertainty associated with the analytical results contained in this report can be estimated from the reported quality assurance results and from published quality control acceptance limits for each analytical test. Matrix quality control results (matrix spike recoveries and matrix sample precision) pertain only to the matrix sample tested and do not necessarily reflect test method performance for other samples.

Typical matrix quality control (QC) measurements may include matrix spike recovery, matrix spike duplicate recovery, matrix spike precision and matrix sample precision. Not all matrix QC results may be available or reportable; where they are not an explanation is provided. Typical reasons for unavailable QC results include, but are not limited to, a) insufficient matrix sample to perform some or all QC measurements; b) analyte concentration in the sample replicated was too low for a meaningful measurement of precision and c) analyte concentration in the matrix sample spiked was too high (relative to the amount of analyte spiked) for a meaningful measurement of recovery. Where matrix QC results are unavailable, other method performance metrics (e.g., LCS recovery, LCS precision, surrogate recovery) may be used to assess performance of the method. Comments explaining any missing QC measurements are not intended to convey any adverse conclusions about the quality of the reported data.

Precision is reported as relative percent difference unless otherwise noted.

Quality Control codes as defined below may be used in this report to indicate results that are associated with one or more quality control elements which did not fall within established test method criteria. Such results may be qualified as estimates using a J qualifier as required by 62-160 F.A.C. Explanations are included in the report for any results that were reported as estimates for other reasons.

QC Codes used in this report may include:

- LCS – Recovery for the batch Laboratory Control Sample (LCS) was outside existing control limits;
- MS – Recovery for the batch matrix spike (MS) was outside existing control limits;
- CCV – Recovery for a continuing calibration verification (CCV) standard was outside existing control limits;
- SUR – Recovery of a surrogate (SUR) for associated analytes was outside existing control limits;
- RPD – The precision, measured as relative percent difference (RPD), of batch replicate measurements was outside existing control limits;
- RSD – The precision, measured as relative standard deviation (RSD), of batch replicate measurements was outside existing control limits;
- SMP – Sample - used precision derived from replicate analyses of a sample;

The following data qualifiers are used, where applicable, in this report as specified in 62-160 F.A.C.

- A - Value reported is the mean of two or more determinations.
- B - Results based on colony counts outside the acceptable range.
- I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J - Estimated value and/or the analysis did not meet established quality control criteria.
- K - Actual value is known to be less than value given.
- L - Actual value is known to be greater than value given.
- N - Presumptive evidence of presence of material.
- O - Sampled, but analysis lost or not performed.
- Q - Sample held beyond normal holding time.
- T - Value reported is less than the criterion of detection.
- U - Material was analyzed for but not detected. The reported value is the method detection limit for the sample analyzed.
- V - Analyte was detected in both sample and method blank.
- X - Too few individuals to calculate SCI value.
- Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate.
- Z - Colonies were too numerous to count (TNTC).

Quality control information from overflow laboratories may not be included in this report. Please refer to the associated report from the overflow laboratory for additional information.

Sample Location: Lake Eden **Collection Date/Time: 09/20/2016 11:50**

Field ID: Lake Eden @ Center Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1833161	EPA 300.0	Bromide**	0.076		mg Br/L	P312450	
	EPA 300.0 Rev. 2.1	Chloride	27	A	mg Cl/L	P312188	
		Sulfate	1.9	A	mg SO4/L	P312193	
	SM 2120 B	Color (true)	160		PCU	P311617	
	SM 2320 B-97	Total Alkalinity	13		mg CaCO3/L	P311803	
	SM 4500 F-C-97	Fluoride	0.059	I	mg F/L	P311805	
1833162	EPA 350.1 Rev. 2.0	Ammonia-N	0.046		mg N/L	P311757	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.94		mg N/L	P312102	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.013		mg N/L	P311899	
	EPA 365.1 Rev. 2.0	Total-P	0.028		mg P/L	P312225	
1833163	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	I	mg P/L	P311602	
1833166	EPA 200.7 Rev. 4.4	Calcium	6.38		mg/L	P311847	
		Iron	100	I	ug/L	P311847	
		Magnesium	2.41		mg/L	P311847	
		Potassium	0.56	I	mg/L	P311847	
		Sodium	17.7		mg/L	P311847	
		Zinc	5.0	U	ug/L	P311847	
	EPA 200.8 Rev. 5.4	Arsenic	0.45		ug/L	P311847	
		Cadmium	0.020	U	ug/L	P311847	
		Chromium	0.19	I	ug/L	P311847	
		Copper	0.10	U	ug/L	P311847	
		Lead	0.14	I	ug/L	P311847	
		Nickel	0.073	I	ug/L	P311847	
		Silver	0.0050	U	ug/L	P311847	

Ref. Method and Comment:
EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for calcium are unavailble for one of two spiked samples because of high analyte concentration in the QC sample.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P311847

Component	Result	Code	Units
Calcium	0.075	U	mg/L
Iron	30	U	ug/L
Magnesium	0.040	U	mg/L
Potassium	0.30	U	mg/L
Sodium	0.50	U	mg/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P311847

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L

Quality Assurance Report
Method Blank Results

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P311847

Component	Result	Code	Units
Chromium	0.050	U	ug/L
Copper	0.10	U	ug/L
Lead	0.050	U	ug/L
Nickel	0.050	U	ug/L
Silver	0.0050	U	ug/L

Reference Method: EPA 300.0
Batch ID: P312450

Component	Result	Code	Units
Bromide	0.016	U	mg Br/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P312188

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P312193

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P311757

Component	Result	Code	Units
Ammonia-N	0.002	U	mg N/L

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P312102

Component	Result	Code	Units
Kjeldahl Nitrogen	0.080	U	mg N/L

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P311899

Component	Result	Code	Units
NO2NO3-N	0.004	U	mg N/L

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P312225

Component	Result	Code	Units
Total-P	0.002	U	mg P/L

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P311602

Component	Result	Code	Units

Quality Assurance Report
Method Blank Results

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P311602

Component	Result	Code	Units
O-Phosphate-P	0.004	U	mg P/L

Reference Method: SM 2120 B
Batch ID: P311617

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P311803

Component	Result	Code	Units
Total Alkalinity	0.65	U	mg CaCO3/L

Reference Method: SM 4500 F-C-97
Batch ID: P311805

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P311847

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	104		P	85 - 115
Iron	106		P	85 - 115
Magnesium	103		P	85 - 115
Potassium	102		P	85 - 115
Sodium	102		P	85 - 115
Zinc	100		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P311847

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	99.8		P	85 - 115
Cadmium	101		P	85 - 115
Chromium	101		P	85 - 115
Copper	96.8		P	85 - 115
Lead	96.9		P	85 - 115
Nickel	98.4		P	85 - 115
Silver	95.1		P	85 - 115

Reference Method: EPA 300.0
Batch ID: P312450

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Bromide	102		P	90 - 110

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P312188

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	98.7		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P312193

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	97.6		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P311757

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	101		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P312102

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	94.6		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P311899

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	96.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P312225

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	97.2		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P311602

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	101		P	90 - 110

Reference Method: SM 2320 B-97
Batch ID: P311803

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P311805

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.2		P	92 - 103

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P311847

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1833166	Calcium	106		P	80 - 120
1833166	Iron	107		P	80 - 120
1833166	Magnesium	109		P	80 - 120
1833166	Potassium	104		P	80 - 120
1833166	Sodium	103		P	80 - 120
1833166	Zinc	104		P	80 - 120
1833696	Iron	112	114	P/P	75 - 125
1833696	Magnesium	103		P	75 - 125
1833696	Potassium	100	105	P/P	75 - 125
1833696	Sodium	102		P	75 - 125
1833696	Zinc	103	97.8	P/P	75 - 125

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P311847

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1833166	Arsenic	102		P	80 - 120
1833166	Cadmium	101		P	80 - 120
1833166	Chromium	100		P	80 - 120
1833166	Copper	98.7		P	80 - 120
1833166	Lead	103		P	80 - 120
1833166	Nickel	97.6		P	80 - 120
1833166	Silver	95.2		P	80 - 120
1833696	Arsenic	104	104	P/P	75 - 125
1833696	Cadmium	105	105	P/P	75 - 125
1833696	Chromium	99.9	101	P/P	75 - 125
1833696	Copper	92.2	92.1	P/P	75 - 125
1833696	Lead	104	104	P/P	75 - 125
1833696	Nickel	93.4	94.1	P/P	75 - 125
1833696	Silver	93.9	95.5	P/P	75 - 125

Reference Method: EPA 300.0
Batch ID: P312450

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1833161	Bromide	102		P	90 - 110
1837469	Bromide	104	104	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P312188

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1833161	Chloride	99.8		P	90 - 110
1833371	Chloride	98.9		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P312193

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1833161	Sulfate	98.1		P	90 - 110
1833371	Sulfate	91.6		P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P311757

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1833065	Ammonia-N	100	99.3	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P312102

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1832773	Kjeldahl Nitrogen	83.9	95.3	F/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P311899

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1833162	NO2NO3-N	90.6	93.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P312225

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1833189	Total-P	103	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P311602

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1833110	O-Phosphate-P	101	102	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P311805

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1832801	Fluoride	98.6	98.0	P/P	91 - 105

Quality Assurance Report
Precision

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P311847

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1833696	Calcium	2.40	Spike	P	0 - 20
1833696	Iron	0.797	Spike	P	0 - 20
1833696	Magnesium	2.14	Spike	P	0 - 20
1833696	Potassium	3.19	Spike	P	0 - 20
1833696	Sodium	1.15	Spike	P	0 - 20
1833696	Zinc	5.13	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P311847

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1833696	Arsenic	0.215	Spike	P	0 - 20
1833696	Cadmium	0.436	Spike	P	0 - 20
1833696	Chromium	1.12	Spike	P	0 - 20
1833696	Copper	0.145	Spike	P	0 - 20
1833696	Lead	0.751	Spike	P	0 - 20
1833696	Nickel	0.759	Spike	P	0 - 20
1833696	Silver	1.67	Spike	P	0 - 20

Reference Method: EPA 300.0
Batch ID: P312450

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1837469	Bromide	0.343	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P312188

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1833161	Chloride	0.0151	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P312193

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1833161	Sulfate	2.28	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P311757

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1833065	Ammonia-N	1.13	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P312102

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1832773	Kjeldahl Nitrogen	8.62	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P311899

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1833162	NO2NO3-N	2.54	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P312225

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1833189	Total-P	0.600	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P311602

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1833110	O-Phosphate-P	0.984	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P311617

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1833205	Color (true)	1.03	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P311803

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1832801	Total Alkalinity	0.177	Sample	P	0 - 4.8

Reference Method: SM 4500 F-C-97
Batch ID: P311805

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1832801	Fluoride	0.525	Spike	P	0 - 3.0

* Sample, spike and/or laboratory control sample precision (LCS) is reported.
Replicate spike precision may be reported when sample results are below quantifiable levels.

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A71759
Included Lab Sample IDs: 1833163

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	99.9	P/P	90 - 110

Reference Method: SM 2120 B
Run ID: A71760
Included Lab Sample IDs: 1833161

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.1	96.9	P/P	85 - 115

Quality Assurance Report
Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A71807
Included Lab Sample IDs: 1833162

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	101	101	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A71811
Included Lab Sample IDs: 1833161

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	101	104	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A71811
Included Lab Sample IDs: 1833161

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.5	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A71854
Included Lab Sample IDs: 1833162

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	95.5	93.5	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A71882
Included Lab Sample IDs: 1833161

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	98.1	97.8	P/P	90 - 110
Sulfate	99.0	98.5	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A71930
Included Lab Sample IDs: 1833166

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	102	102	P/P	90 - 110
Iron	102	103	P/P	90 - 110
Magnesium	102	103	P/P	90 - 110
Potassium	101	101	P/P	90 - 110
Sodium	100	100	P/P	90 - 110
Zinc	99.5	103	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A71944
Included Lab Sample IDs: 1833166

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	99.8	99.9	P/P	90 - 110
Cadmium	100	99.8	P/P	90 - 110
Chromium	100	99.5	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A71944
Included Lab Sample IDs: 1833166

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Copper	96.8	97.3	P/P	90 - 110
Lead	97.5	92.9	P/P	90 - 110
Nickel	97.8	98.4	P/P	90 - 110
Silver	95.2	95.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A71984
Included Lab Sample IDs: 1833162

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.8	99.2	P/P	90 - 110

Reference Method: EPA 300.0
Run ID: A71988
Included Lab Sample IDs: 1833161

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Bromide	99.2	97.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A72009
Included Lab Sample IDs: 1833162

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.7	97.3	P/P	90 - 110

* Pass/Fail determinations are made for each bracketing calibration verification check.
Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.
Where they are different, both control limits are provided.

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision		
						LCS	SMP	MS
EPA 200.7 Rev. 4.4	Calcium	104	106					2.40
	Iron	106	107	112	114			0.797
	Magnesium	103	109	103				2.14
	Potassium	102	104	100	105			3.19
	Sodium	102	103	102				1.15
	Zinc	100	104	103	97.8			5.13
EPA 200.8 Rev. 5.4	Arsenic	99.8	102	104	104			0.215
	Cadmium	101	101	105	105			0.436
	Chromium	101	100	99.9	101			1.12
	Copper	96.8	98.7	92.2	92.1			0.145
	Lead	96.9	103	104	104			0.751
	Nickel	98.4	97.6	93.4	94.1			0.759
	Silver	95.1	95.2	93.9	95.5			1.67
EPA 300.0	Bromide	102	104	104	102			0.343
EPA 300.0 Rev. 2.1	Chloride	98.7	99.8	98.9			0.0151	

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision		
					LCS	SMP	MS
EPA 300.0 Rev. 2.1	Sulfate	97.6	98.1	91.6		2.28	
EPA 350.1 Rev. 2.0	Ammonia-N	101	100	99.3			1.13
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	94.6	83.9	95.3			8.62
EPA 353.2 Rev. 2.0	NO2NO3-N	96.0	90.6	93.2			2.54
EPA 365.1 Rev. 2.0	Total-P	97.2	103	102			0.600
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	101	102			0.984
SM 2120 B	Color (true)					1.03	
SM 2320 B-97	Total Alkalinity	103				0.177	
SM 4500 F-C-97	Fluoride	99.2	98.6	98.0			0.525

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1833166
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1833166
EPA 300.0 / E31780	Bromide in aqueous matrices	1833161
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1833161
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1833161
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1833162
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1833162
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1833162
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1833162
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1833163
SM 2120 B / E31780	True Color measured at 450 nm	1833161
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1833161
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1833161

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 200.7 Rev. 4.4	09/21/2016	09/26/2016	Elliott D. Healy	09/29/2016	Joshua Ayres	1833166
EPA 200.8 Rev. 5.4	09/21/2016	09/26/2016	Elliott D. Healy	09/29/2016	Charles J. Peterson	1833166
EPA 300.0	09/21/2016			10/05/2016	Ping Hua	1833161
EPA 300.0 Rev. 2.1	09/21/2016			09/30/2016	Ping Hua	1833161
EPA 350.1 Rev. 2.0	09/21/2016			09/22/2016	Sofia Elnemr	1833162
EPA 351.2 Rev. 2.0	09/21/2016	09/29/2016	Adrian Shelby	10/04/2016	Joseph Suarez	1833162
EPA 353.2 Rev. 2.0	09/21/2016			09/27/2016	Peter D. Kaus	1833162
EPA 365.1 Rev. 2.0	09/21/2016	09/30/2016	Vijayalakshmi Reddy	10/03/2016	Lipi Saha	1833162
EPA 365.1 Rev. 2.0 dissolved	09/21/2016			09/21/2016 15:12	Julia Storbeck	1833163
SM 2120 B	09/21/2016			09/21/2016 19:33	Julie Michelle Frank	1833161
SM 2320 B-97	09/21/2016			09/24/2016	Dale L. Simmons	1833161
SM 4500 F-C-97	09/21/2016			09/24/2016	Dale L. Simmons	1833161